

1 **ABSTRACT OF THE DISCLOSURE**

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A thermally-integrated lower temperature water-gas shift reactor apparatus for converting carbon monoxide in the presence steam comprises a catalyst bed that is disposed within an outer region surrounding a waste heat recovery steam generator operating at a selected pressure corresponding to the optimum temperature for conducting the catalytic water-gas shift reaction and a process for useful recovery of the exothermic heat of reaction to generate steam that is used in a process for the conversion of hydrocarbon feedstock into useful gases such as hydrogen.